

24. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output;  
and

a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light.

25. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output;  
and

a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path.

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30. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage; and

a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path.

31. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage; and

an LED array having an input connected to the output of the power supply.

32. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;  
and

a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light.

33. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;

and

a plurality of LEDs electrically configured such that the failure of a single LED results in continued emission of light from a substantial number of the rest of the plurality of LEDs.

34. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;  
and

a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path.

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35. A power supply assembly for powering light emitting diodes (LEDs), comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;  
and

an LED array having an input connected to the output of the power supply.

36. The assembly according to claims 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35, further comprising a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

37. The assembly according to claims 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35 wherein the switchmode power supply comprises an integrated circuit power supply.

38. The assembly of claim 37 wherein the integrated circuit power supply comprises a power factor correcting switchmode converter integrated circuit.

39. The assembly according to claims  
24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35  
including an electromagnetic interference filter  
means coupled to the power supply for preventing  
conducted interference from feeding back onto a.c.  
power lines connected to the electrical input.

40. The assembly according to claims 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35 further comprising a conflict monitor compatibility circuit, wherein the LEDs provide a high impedance condition in the presence of leakage currents, and the conflict monitor compatibility circuit includes:

a transistor coupled to the LEDs and biased as a switch that switches from an essentially nonconductive condition in the absence of the high impedance condition to an essentially conductive condition in the presence of the high impedance condition; and

a low impedance load in series connection  
with the transistor and in parallel connection with  
the LED load,

whereby leakage currents are shunted through the low impedance load, ensuring compatibility with conflict monitors designed for incandescent bulbs.



41. The assembly according to claims 24, 25, 27, 28, 29, 30, 32, 33 or 34 wherein the plurality of LEDs comprise a plurality of series-parallel connected LEDs arranged in strings.

42. The assembly according to claim 41 wherein the plurality of LEDs comprise a ballast resistor in each string.

43. The assembly according to claims 26, 31 or 35 wherein the LED array comprises a ballast resistor in each string of the array.

44. A conflict monitor compatibility circuit for use in traffic and pedestrian signaling applications, comprising:

an LED load providing a high impedance condition in the presence of leakage currents from a solid state traffic controller switch;

a transistor coupled to the LED load and biased as a switch that switches from an essentially nonconductive condition in the absence of the high impedance condition to an essentially conductive condition in the presence of the high impedance condition; and

a low impedance load in series connection with the transistor and in parallel connection with the LED load,

whereby leakage currents are shunted through the low impedance load, ensuring compatibility with the conflict monitors designed for incandescent bulbs.

45. An apparatus for supplying power to an LED array comprising:

a rectifier (32) having an input and an output, said rectifier (32) being responsive to power at said input for generating rectified power at said output;

a power factor correction converter (38) having an input connected to said output of said rectifier (32) and an output, said power factor correction converter (38) being responsive to said rectified power at said power factor correction converter input for generating one of constant current and constant voltage at said power factor correction converter output; and

an LED array (12) having an input connected to said output of said power factor correction converter (38) for receiving said one of said constant current and constant voltage to illuminate said LED array (12).

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